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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/599,581

Applicant(s)

SABATTINI ET AL.

Examiner

EUGENIA WANG

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 April 2010.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 22-48 is/are pending in the application.
4a) Of the above claim(s) 34-48 is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 22-33 is/are rejected.
7) ☒ Claim(s) 28 is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/226)
Paper No(s)/Mail Date 10/2/06
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Claims 34-48 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected inventions, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on April 21, 2010.

Response to Arguments

2. Applicant's election with traverse of Group 1 (claims 22-33) in the reply filed on April 21, 2010 is acknowledged. The traversal is on the ground(s) that all of the other independent claims (34, 45, and 47) relates to the use of the electrolyte (of claim 22) via process of producing, the use of the electrolyte on a current collector, and a method of making that electrolyte/current collector combination) (wherein claim 47 has been amended to do so). This is not found persuasive because although they may share one common element, the special technical feature lies within the different requirements of the claims (be it the method or structure). It is submitted that the original restriction requirement has clearly set forth how each group lacks its own special technical feature. (Furthermore it is submitted that the newly amended claim 47 still has a different special technical feature than that of the other claims, by requiring a directionality of how a electrolytic mixture and current collector and an electrode are related). Furthermore, it is submitted that claim 22 is anticipated (see 102 rejection below), and thus there is an X-reference to claim 22, which shows that claim 22 lacks a special technical feature,

thus supporting Examiner's position that the groups set forth above have different special technical features.

The requirement is still deemed proper and is therefore made FINAL.

Preliminary Amendment

3. The preliminary amendment received October 2, 2006 is acknowledged.

Information Disclosure Statement

4. The information disclosure statement filed October 2, 2006 fails to comply with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609 because it does not provide a legible copy of each foreign patent document and a corresponding statement of relevance. It has been placed in the application file, but the information referred to therein has not been considered as to the merits. Applicant is advised that the date of any re-submission of any item of information contained in this information disclosure statement or the submission of any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the statement, including all certification requirements for statements under 37 CFR 1.97(e). See MPEP § 609.05(a).

5. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609.04(a) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

Oath/Declaration

6. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because: It is unclear as to whether or not priority is claimed. Although a PCT document is cited, priority is clearly checked as to being claimed. It is noted that this contradicts with the Application Data Sheet, wherein priority appears to be claimed. Clarification is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 22-33 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a. Claim 22 claims that there are "carbonates" in the mixture. However, it is uncertain from the claim language as to whether or not such carbonates are provided from one compound (i.e. that the addition of more than one mol of a carbonate would constitute in multiple carbonates) or from multiple carbonate compounds. Accordingly, such claim language is seen to be unclear and indefinite. (Note: For prosecution of the application, the inclusion of one carbonate compound constitutes "carbonates" as a single material can provide carbonates.) Since claims 23-33 are dependent upon claim 22, they are rejected for the same reason.

b. Claim 22 states that the carrier solution is "a mixture of one or more organic solvents and water." However such claim language does not clearly set forth what is required of the carrier solution. Does the carrier solution require water? (I.e. (1) A mixture of organic solvent(s) and water, wherein an organic solvent and water is present or (2) a mixture of organic solvents and water, wherein a mixture of two organic solvents suffices.) Accordingly, such claim language is unclear and indefinite. Since claims 23-33 are dependent upon claim 22, they are rejected for the same reason.

c. Claim 28 contains the trademark/trade name Vaseline. Where a trademark or trade name is used in a claim as a limitation to identify or describe a particular material or product, the claim does not comply with the requirements of 35 U.S.C. 112, second paragraph. See *Ex parte Simpson*, 218 USPQ 1020 (Bd. App. 1982). The claim scope is uncertain since the trademark or trade name cannot be used properly to identify any particular material or product. A trademark or trade name is used to identify a source of goods, and not the goods themselves. Thus, a trademark or trade name does not identify or describe the goods associated with the trademark or trade name. In the present case, the trademark/trade name is used to identify/describe petroleum jelly and, accordingly, the identification/description is indefinite.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 22 and 33 are rejected under 35 U.S.C. 102(b) as being anticipated by WO 02/41423 (Friedrich). It is noted that US 2004/0062981 is being relied upon as the English translation of the listed WO document, as they both correspond to the same PCT application.

As to claim 22, Friedrich teaches of an electrolyte material for a molten carbonate fuel cell, wherein a mixture of lithium carbonate (providing the carbonates in the mixture), an organic acid such as acetic acid (organic solvent), and water is mixed (para 0039).

As to claim 33, Friedrich teaches that the materials are moldable (before dried) thus constituting a spreadable paste, as it can be molded and formed into the electrolyte (barring specification as to what constitutes a spreadable paste). Office personnel are to give claims their broadest reasonable interpretation in light of the supporting disclosure. *In re Morris*, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Also, limitations appearing in the specification but not recited in the claim are not read into the claim. See *In re Zletz*, 893F.2d 319, 321-22, 13 USPQ2d, 1320, 1322 (Fed. Cir. 1989).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Friedrich, as applied to claim 22, in view of US 4980248 (Fujita).

As to claim 23, Friedrich teaches the use of lithium carbonate in the electrolyte but does not teach that the carbonates are a stoichiometric ratio of $\text{Li}_2\text{CO}_3/\text{K}_2\text{CO}_3$ of 62/38.

However, Fujita teaches of a molten carbonate fuel, a mixture of Li_2CO_3 and K_2CO_3 is used (col. 2, lines 15-24). Specifically, it is noted that the stoichiometric ratio

(as applied to the chemical reaction) is being referred to (col. 2, lines 49-65). It is noted that an appreciated initial value of Li:K is 62:38 (thus the $\text{Li}_2\text{CO}_3/\text{K}_2\text{CO}_3$ is 62/38, as both compounds have the same molar amounts of Li and K, respectively) (col. 3, lines 21-25). The motivation for wanting to keep the Li:K ratio (via Li_2CO_3 and K_2CO_3) at 62:38 (a value approximately 60:40) is that such an carbonate mixture would prevent the fuel cell from reducing its battery characteristic (col. 3, lines 21-35). Therefore it would have been obvious to one having ordinary skill in the art at the time the claimed invention was made to use $\text{Li}_2\text{CO}_3/\text{K}_2\text{CO}_3$ in a 62/38 ratio as the carbonates within the electrolyte mixture, in order to provide carbonates that would prevent the fuel cell from reducing its battery characteristics.

It is noted that such is inherently a eutectic mixture, as such a eutectic mixture is a mixture wherein one solidifies at a much lower temperature than the other. And thus since the same mixture is being appreciated, such a characteristic would be inherent.

Where applicant claims a composition in terms of a function, property or characteristic and the composition of the prior art is the same as that of the claim but the function is not explicitly disclosed by the reference, the examiner may make a rejection under both 35 U.S.C. 102 and 103, expressed as a 102/103 rejection.

The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. In re Rijckaert, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993).

"In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the

allegedly inherent characteristic necessarily flows from the teachings of the applied prior art." Ex parte Levy, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990)

The Examiner invites applicant to provide that the prior art products do not necessarily or inherently possess the characteristics of his [or her] claimed product.

Whether the rejection is based on inherency' under 35 U.S.C. 102, on prima facie obviousness' under 35 U.S.C. 103, jointly or alternatively, the burden of proof is the same...[footnote omitted]." The burden of proof is similar to that required with respect to product-by-process claims. In re Fitzgerald, 619 F.2d 67, 70, 205 USPQ 594, 596 (CCPA 1980) (quoting In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977)).

As to claim 24, Friedrich teaches the use of lithium carbonate in the electrolyte but does not teach that the carbonates are a stoichiometric ratio of $\text{Li}_2\text{CO}_3/\text{K}_2\text{CO}_3$ of between 3:1 and 1:1.

However, Fujita teaches of a molten carbonate fuel, a mixture of Li_2CO_3 and K_2CO_3 is used (col. 2, lines 15-24). Specifically, it is noted that the stoichiometric ratio (as applied to the chemical reaction) is being referred to (col. 2, lines 49-65). It is noted that an appreciated initial value of Li:K is 62:38 (thus the $\text{Li}_2\text{CO}_3/\text{K}_2\text{CO}_3$ is 62/38, as both compounds have the same molar amounts of Li and K, respectively) (col. 3, lines 21-25). (This yields a ratio of 1.63:1, which falls within the claimed range.) The motivation for wanting to keep the Li:K ratio (via Li_2CO_3 and K_2CO_3) at 62:38 (a value approximately 60:40) is that such a carbonate mixture would prevent the fuel cell from reducing its battery characteristic (col. 3, lines 21-35). Therefore it would have been

obvious to one having ordinary skill in the art at the time the claimed invention was made to use $\text{Li}_2\text{CO}_3/\text{K}_2\text{CO}_3$ in a 62/38 ratio as the carbonates within the electrolyte mixture, in order to provide carbonates that would prevent the fuel cell from reducing its battery characteristics.

As to claim 25, Friedrich teaches the use of lithium carbonate in the electrolyte but does not teach that the carbonates are a stoichiometric ratio of $\text{Li}_2\text{CO}_3/\text{K}_2\text{CO}_3$ 1.7:1.

However, Fujita teaches of a molten carbonate fuel, a mixture of Li_2CO_3 and K_2CO_3 is used (col. 2, lines 15-24). Specifically, it is noted that the stoichiometric ratio (as applied to the chemical reaction) is being referred to (col. 2, lines 49-65). It is noted that an appreciated initial value of Li:K is 62:38 (thus the $\text{Li}_2\text{CO}_3/\text{K}_2\text{CO}_3$ is 62/38, as both compounds have the same molar amounts of Li and K, respectively) (col. 3, lines 21-25). (This yields a ratio of 1.63:1.) The motivation for wanting to keep the Li:K ratio (via Li_2CO_3 and K_2CO_3) at 62:38 (a value approximately 60:40) is that such a carbonate mixture would prevent the fuel cell from reducing its battery characteristic (col. 3, lines 21-35). Therefore it would have been obvious to one having ordinary skill in the art at the time the claimed invention was made to use $\text{Li}_2\text{CO}_3/\text{K}_2\text{CO}_3$ in a 62/38 ratio as the carbonates within the electrolyte mixture, in order to provide carbonates that would prevent the fuel cell from reducing its battery characteristics. It is noted that 1.63:1 is seen to be particularly close to 1.7:1. It has been held that when the difference between a claimed invention and the prior art is the range or value of a particular variable, then a prima facie rejection is properly established when the difference in the range or value is minor. Titanium Metals Corp. of Am. v. Banner, 778 F.2d 775, 783, 227 USPQ 773,

779 (Fed. Cir. 1985). Generally, differences in ranges will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such ranges is critical. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). In re Hoeschele, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969). Claims that differ from the prior art only by slightly different (non-overlapping) ranges are prima facie obvious without a showing that the claimed range achieves unexpected results relative to the prior art. (In re Woodruff, 16 USPQ2d 1935,1937 (Fed. Cir. 1990))

10. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Friedrich, as applied to claim 22, in view of US 411632 (Kinoshita et al.).

As to claim 26, Friedrich teaches the use of lithium carbonate in the electrolyte but does not teach that the carbonates in the electrolyte are a mixture of LiCO_3 (lithium carbonate) and LiKCO_3 .

However Kinoshita et al. teach that metal carbonates alone and in combination would have been obvious to one of ordinary skill in the art (col. 1, lines 11-22). Such salts include Li_2CO_3 and LiKCO_3 (table 1 in col. 1). Accordingly, as Kinoshita et al. appreciates the combinations of carbonates as well as individual carbonates, the combination of Li_2CO_3 (appreciated by both Friedrich and Kinoshita et al.) and LiKCO_3 (appreciated by Kinoshita et al.) would have yielded the predictable result of producing an electrolyte that operated in the same manner (i.e. as an electrolyte for a molten carbonate fuel cell). Therefore it would have been obvious to one having ordinary skill in the art at the time the claimed invention was made to combine LiKCO_3 (taught by

Kinoshita et al.) with Li_2CO_3 (as taught by Friedrich), as Kinoshita et al. sets forth the fact that carbonate materials can be mixed to produce an electrolyte, and thus the mixture of two known carbonate materials for a molten carbonate fuel cell electrolyte would have yielded the predictable result of operating as such an electrolyte.

11. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Friedrich and Kinoshita et al., as applied to claims 22 and 26, in further view of Fujita.

As to claim 27, it is noted that the combination of Friedrich and Kinoshita et al. has rendered obvious the carbonate mixture of LiCO_3 and LiKCO_3 . However, the combination does not teach of a specified stoichiometric ratio that must be maintained.

However, Fujita teaches of the importance of Li:K (in general, even if the mixture of Li-containing and K-containing carbonates are not exactly the same) within an a molten carbonate fuel cell (col. 2, lines 15-24). In such a manner, it is submitted that Fujita et al. teach that Li:K ratio in a molten carbonate fuel cell electrolyte is important (regardless as to what carries the Li and K) and affects battery characteristics (col. 2, lines 15-24; col. 3, lines 32-35). Thus Fujita sets forth that Li:K is a result effective variable. It would have been obvious to one having ordinary skill in the art at the time the invention was made to optimize the Li:K stoichiometric ratio (as provided by a mixture of LiKCO_3 and LiCO_3 , i.e. 3:1), since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). It has been held that discovering that general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Generally, differences in ranges will not support the patentability of subject matter encompassed by the prior art *unless* there is evidence indicating such ranges is critical. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). *In re Hoeschele*, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969).

12. Claims 28-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Friedrich, as applied to claim 22, in view of US 4411968 (Reiser et al.) and US 2004/0202921 (Allen), as evidenced by US 2003/017052 (Hodgson et al.).

As to claim 28, Friedrich teaches the use of an organic solvent (organic acid) in making an electrolyte matrix (para 0039); however, Friedrich does not teach of the inclusion of Vaseline, wax, or glycerine.

However, Reiser et al. teach of a molten carbonate fuel cell (title). It is noted that the electrolyte matrix needs to be synthesized with a certain viscosity in order to guarantee good slurry properties; it is noted that alcohols are noted to be added to guarantee good flow (col. 3, lines 39-48). Therefore it would have been obvious to one having ordinary skill in the art at the time the claimed invention was made to add alcohols to the electrolytic matrix slurry of Friedrich in order to impart good flow characteristics. It is noted that although at this point the combination does not yet obviate the use of Vaseline, wax, or glycerine, Allen is relied upon at this point that alcohol and glycerin solvents are art recognized equivalents (para 0034, lines 48-50). It would have been obvious to one having ordinary skill in the art at the time the invention was made to use glycerin (instead of alcohol) as a solvent, since it has been held to be

within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416. At the very least, the substitution of glycerin for alcohol as a solvent would have provided the predictable result of providing the same effect (viscosity altering solvent). (Hodgson et al. is relied upon at this point as an evidentiary reference to show that that glycerol (another name for glycerine) is indeed a thickening agent for an electrolytic material (para 0023).) Therefore it would have been obvious to one having ordinary skill in the art at the time the claimed invention was made to use glycerin as a viscosity providing solvent (as taught by Allen, rather than alcohol, obviated by Friedrich and Reiser et al.), as the use of such a solvent would have yielded the predictable result of having viscous electrolytic matrix.

As to claims 29-30, it is noted that Friedrich teaches the use of an organic solvent (organic acid) and water in making an electrolyte matrix (para 0039); however, Friedrich does not teach (a) the combination of glycerine and water (as required by claims 29 and 30), wherein (b) the glycerine content is between 5% and 80% by weight (as required by claim 29), and (c) more specifically 15% to 50% by weight (as required by claim 30) .

As to (a), Reiser et al. teach of a molten carbonate fuel cell (title). It is noted that the electrolyte matrix needs to be synthesized with a certain viscosity in order to guarantee good slurry properties; it is noted that alcohols are noted to be added to guarantee good flow (col. 3, lines 39-48). Therefore it would have been obvious to one having ordinary skill in the art at the time the claimed invention was made to add

alcohols to the electrolytic matrix slurry of Friedrich (which already includes water) in order to impart good flow characteristics. It is noted that although at this point the combination does not yet obviate the use of Vaseline, wax, or glycerine, Allen is relied upon at this point that alcohol and glycerin solvents are art recognized equivalents (para 0034, lines 48-50). It would have been obvious to one having ordinary skill in the art at the time the invention was made to add glycerin (instead of alcohol) as a solvent, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416. At the very least, the substitution of glycerin for alcohol as a solvent would have provided the predictable result of providing the same effect (viscosity altering solvent). (Hodgson et al. is relied upon at this point as an evidentiary reference to show that that glycerol (another name for glycerine) is indeed a thickening agent for an electrolytic material (para 0023).) Therefore it would have been obvious to one having ordinary skill in the art at the time the claimed invention was made to use glycerin as a viscosity providing solvent (as taught by Allen, rather than alcohol, obviated by Friedrich and Reiser et al.), as the use of such a solvent would have yielded the predictable result of having viscous electrolytic matrix.

As to (b) and (c), it is first noted that the combination above renders obvious a mixture of glycerine and water. Although no specific mixture composition is specified, it is noted that Reiser et al. set forth that viscosity is a result effective variable, wherein it (and thus the composition of the solvents that affect it) affects the flow properties of the slurry. It would have been obvious to one having ordinary skill in the art at the time the

invention was made to optimize the solvent composition (i.e. 5-80% by weight of glycerine (as applied to claim 29) or 15-50% by weight of glycerine (as applied to claim 30), since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). It has been held that discovering that general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233. Generally, differences in ranges will not support the patentability of subject matter encompassed by the prior art *unless* there is evidence indicating such ranges is critical. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). *In re Hoeschele*, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969).

13. Claims 31-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Friedrich, as applied to claim 22, in further view of US 5468573 (Bregoli et al.).

As to claims 31-32, Friedrich does not specifically teach the quantity of carbonates within the electrolytic mixture (between 50-90%, as required by claim 31, and between 70-80%, as required by claim 32).

However, Bregoli et al. teach that the percentage of carrier vs electrolytic material (carbonate powder) is important in ensuring that the electrolyte will not become loose within the stacked cell assembly (col. 2, lines 17-32; col. 3, lines 21-23). The amount recommended is 70% (col. 2, line 20-25). Therefore, the motivation to provide a 70% amount of carbonate is in order to ensure that the electrolyte slurry will have good flow characteristics and to ensure good adherence (col. 2, lines 17-32). Therefore

it would have been obvious to one having ordinary skill in the art at the time the claimed invention was made to use a 70% amount of carbonate in order to ensure that the electrolyte slurry will have good flow characteristics and to ensure good adherence.

It is noted that the 70% is not given units in Bregoli et al., however, such a percentage would necessarily refer to either weight or volume, wherein differences in either would be slight in such a manner that it would still render obvious the claim language. Thus in such a manner, if it is shown that volumetric percentage is meant in such a manner that the percentage falls outside of the claimed weight percentage: It has been held that when the difference between a claimed invention and the prior art is the range or value of a particular variable, then a prima facie rejection is properly established when the difference in the range or value is minor. Titanium Metals Corp. of Am. v. Banner, 778 F.2d 775, 783, 227 USPQ 773, 779 (Fed. Cir. 1985). Generally, differences in ranges will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such ranges is critical. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). In re Hoeschele, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969). Claims that differ from the prior art only by slightly different (non-overlapping) ranges are prima facie obvious without a showing that the claimed range achieves unexpected results relative to the prior art. (In re Woodruff, 16 USPQ2d 1935,1937 (Fed. Cir. 1990))

Additionally, at the very least, Bregoli et al. sets forth that the amount of electrolyte (carbonates) is a result effective variable (that affects adherence as well as flow characteristics) (col. 2, lines 17-32). It would have been obvious to one having

ordinary skill in the art at the time the invention was made to optimize the amount of carbonates in the electrolytic mixture (i.e. 50-90 weight %, as applied to claim 31 and 70-80 weight %, as applied to claim 32), since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). It has been held that discovering that general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233. Generally, differences in ranges will not support the patentability of subject matter encompassed by the prior art *unless* there is evidence indicating such ranges is critical. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). *In re Hoeschele*, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to EUGENIA WANG whose telephone number is (571)272-4942. The examiner can normally be reached on a flex schedule, generally 6 - 3:30 Mon. - Thurs., EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/E. W./
Examiner, Art Unit 1795

/Gregg Cantelmo/
Primary Examiner, Art Unit 1795